Sustainable Design Projects at Assateague Island National Seashore

Chris Finlay - Architect

Assateague Island National Seashore


Where is Assateague
Island National Seashore?

Current Projects

Telephone Pole Removal - Bike Trail Guardrail

Day-Use and Campground Bathhouses

Lifeguard Stand Replacement

Entrance Station Relocation

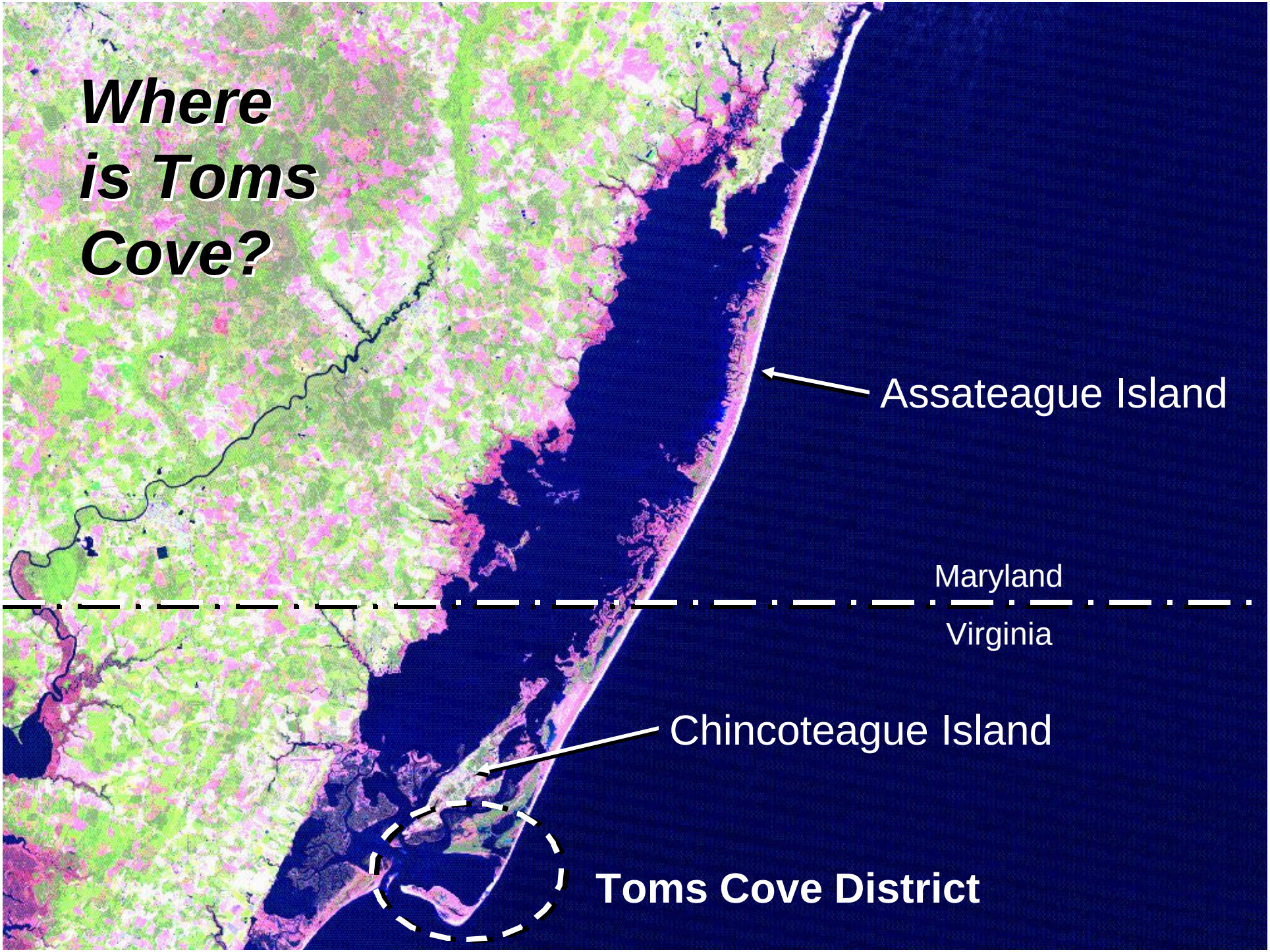
Headquarters Complex

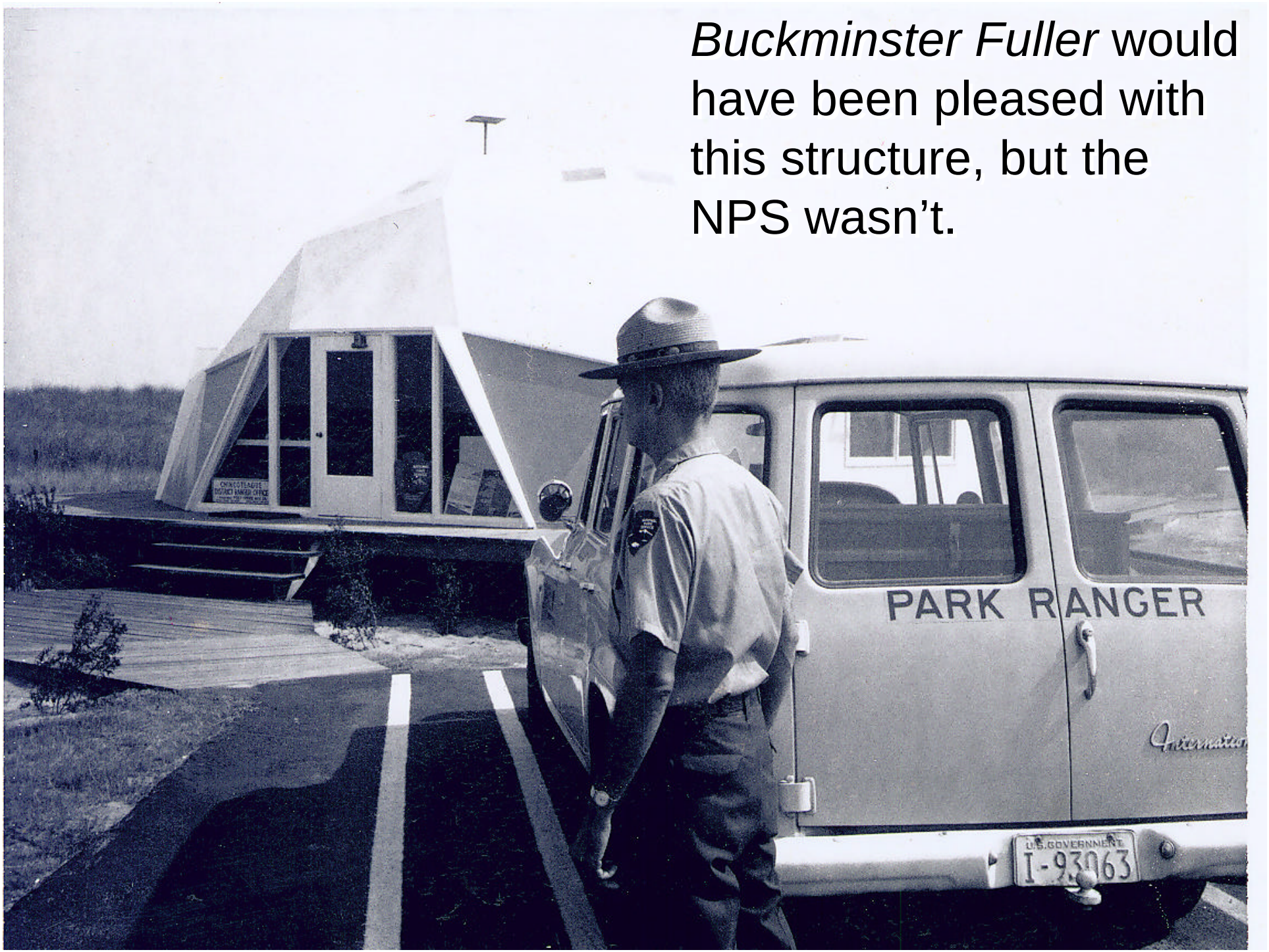
Assateague Beach Coast Guard Station

Sustainable Bathhouse Project

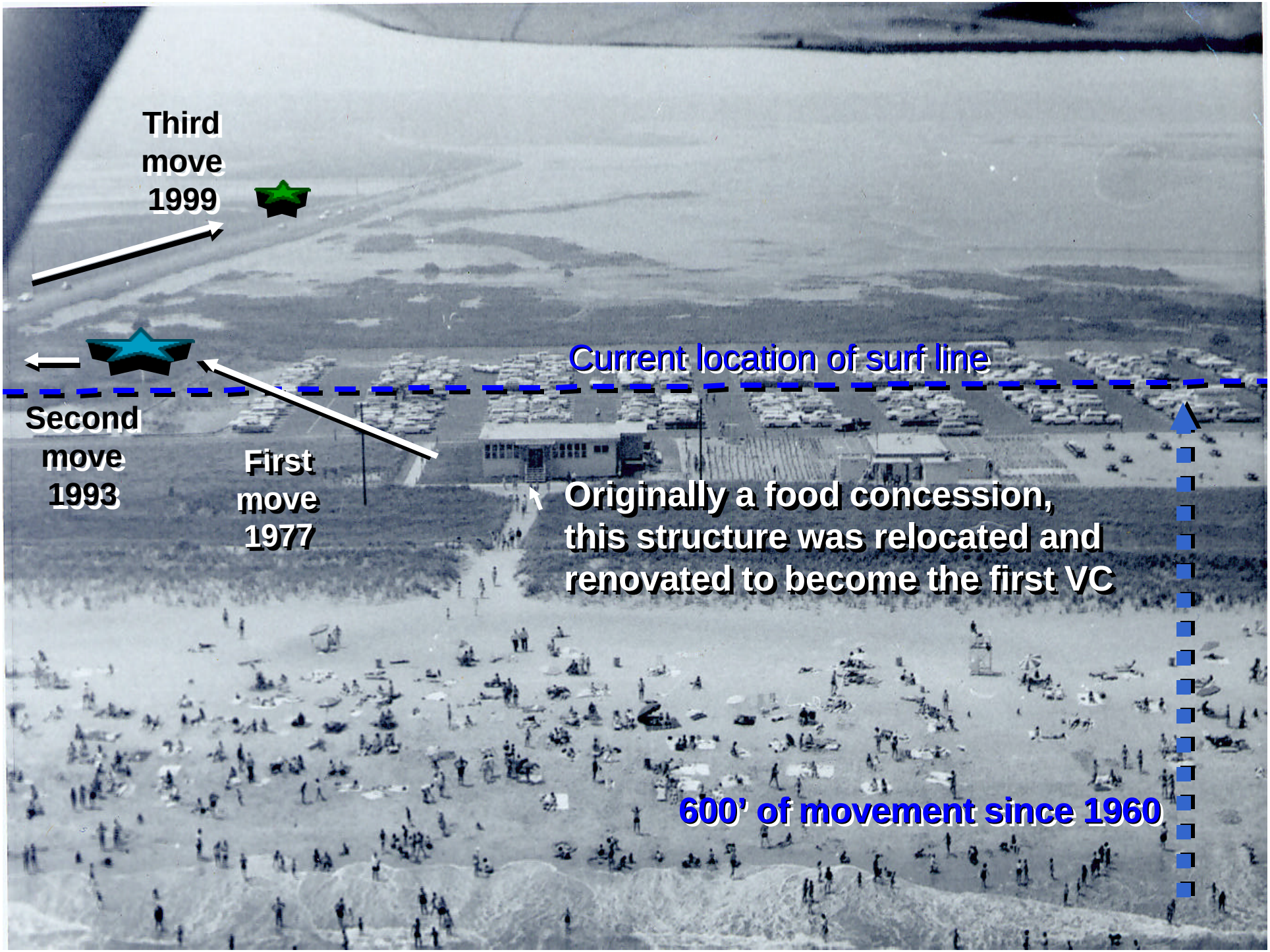
Toms Cove Visitor Center Relocation

Valentine's Lodge

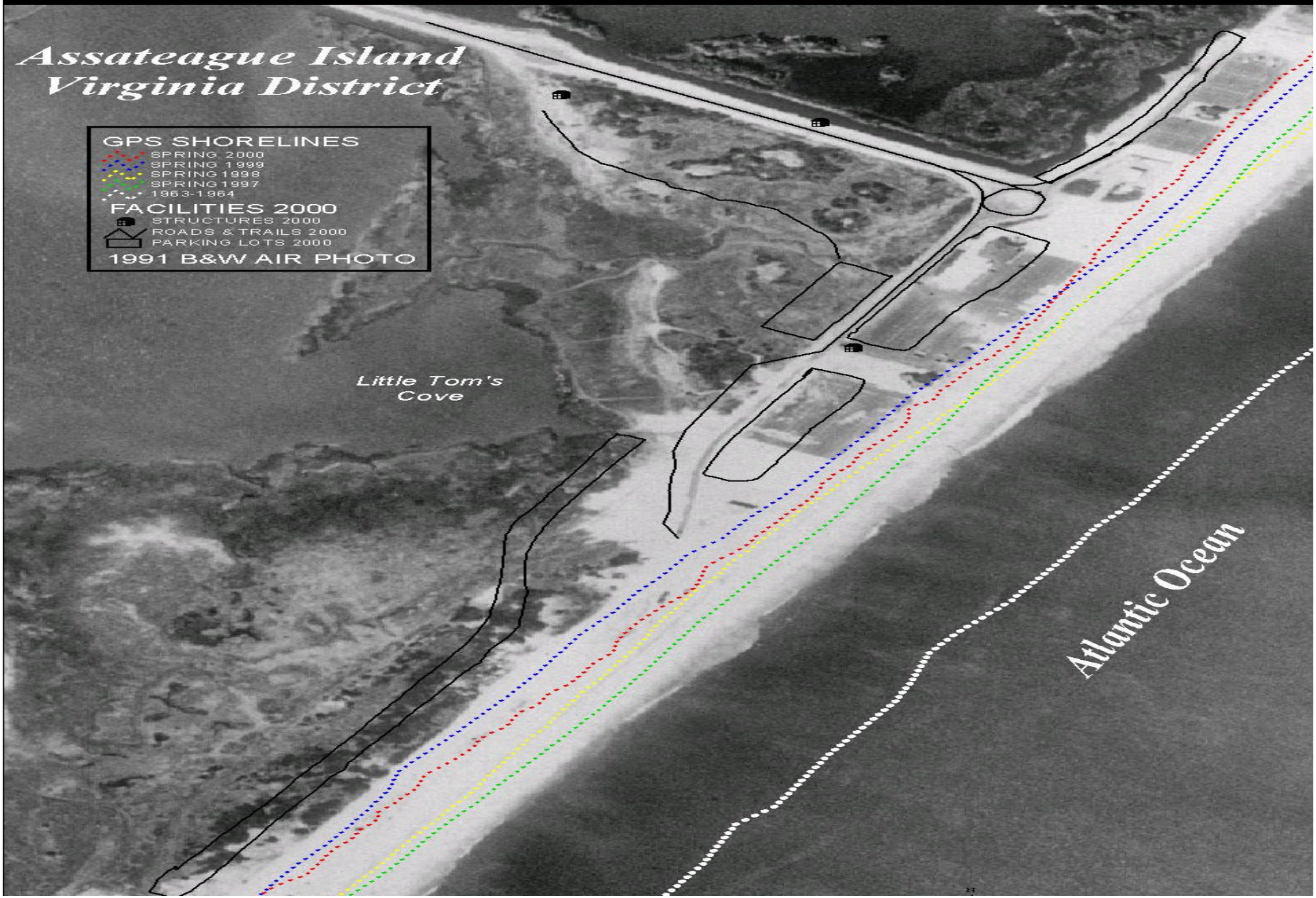

Where is Toms Cove?
Assateague Island
Maryland
Virginia
Chincoteague Island
Toms Cove District



Buckminster Fuller would have been pleased with this structure, but the NPS wasn't.


Third move 1999
Second move 1993
First move 1977
Current location of surf line
Originally a food concession, this structure was relocated and renovated to become the first VC
600' of movement since 1960

Rapid Shoreline Movement



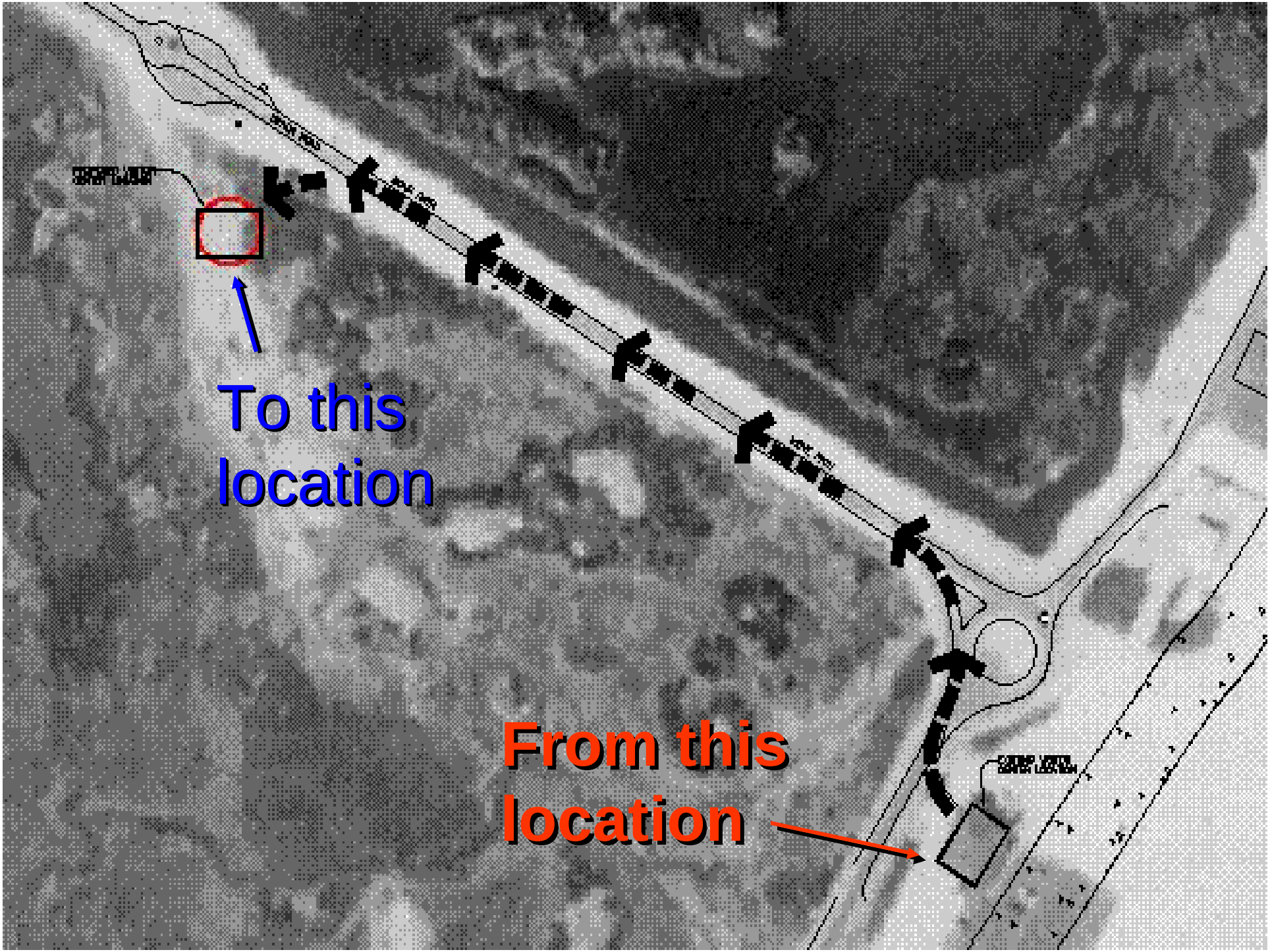
Rustic Modernism Gone Bad

Existing facilities at the Chincoteague Day-Use Area include this restaurant and bathhouse, restrooms and a parking area. Present plans call for extending these facilities to meet demands.


What did you do to the venerable
Toms Cove Visitor Center?
TOMS COVE
VISITOR CENTER

We moved it...

Timber matting protected root zones and soil during construction - prevents invasive phragmites

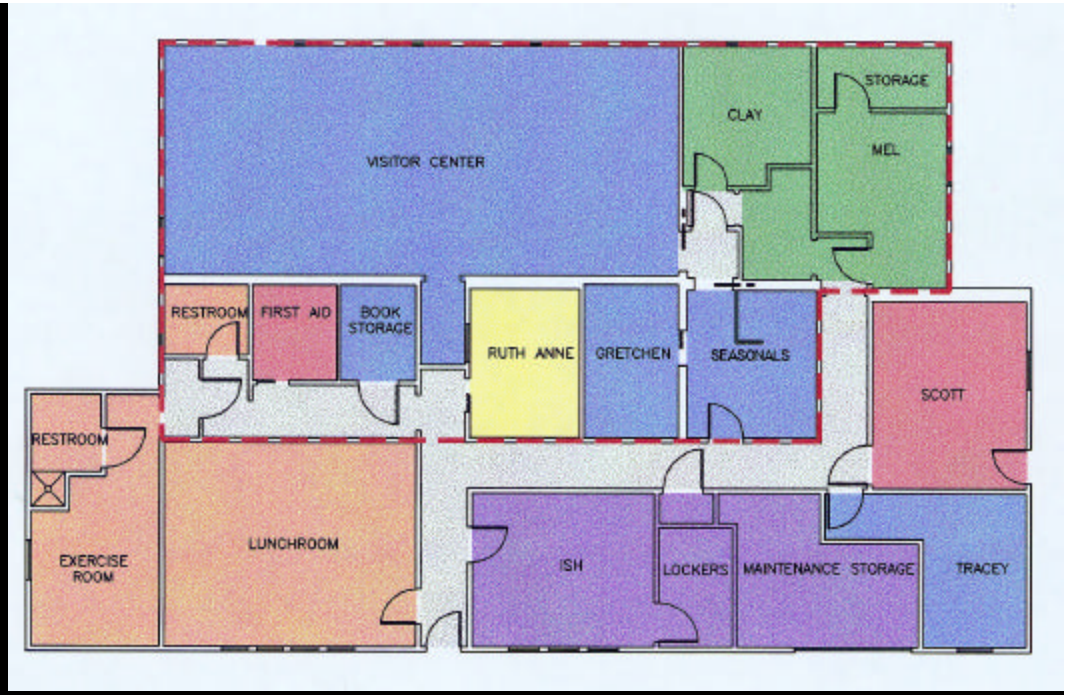

To this location
From this location


And we renovated the interior and exterior...

GOAL 1: Relocate the existing structure to a more stable location on the island.

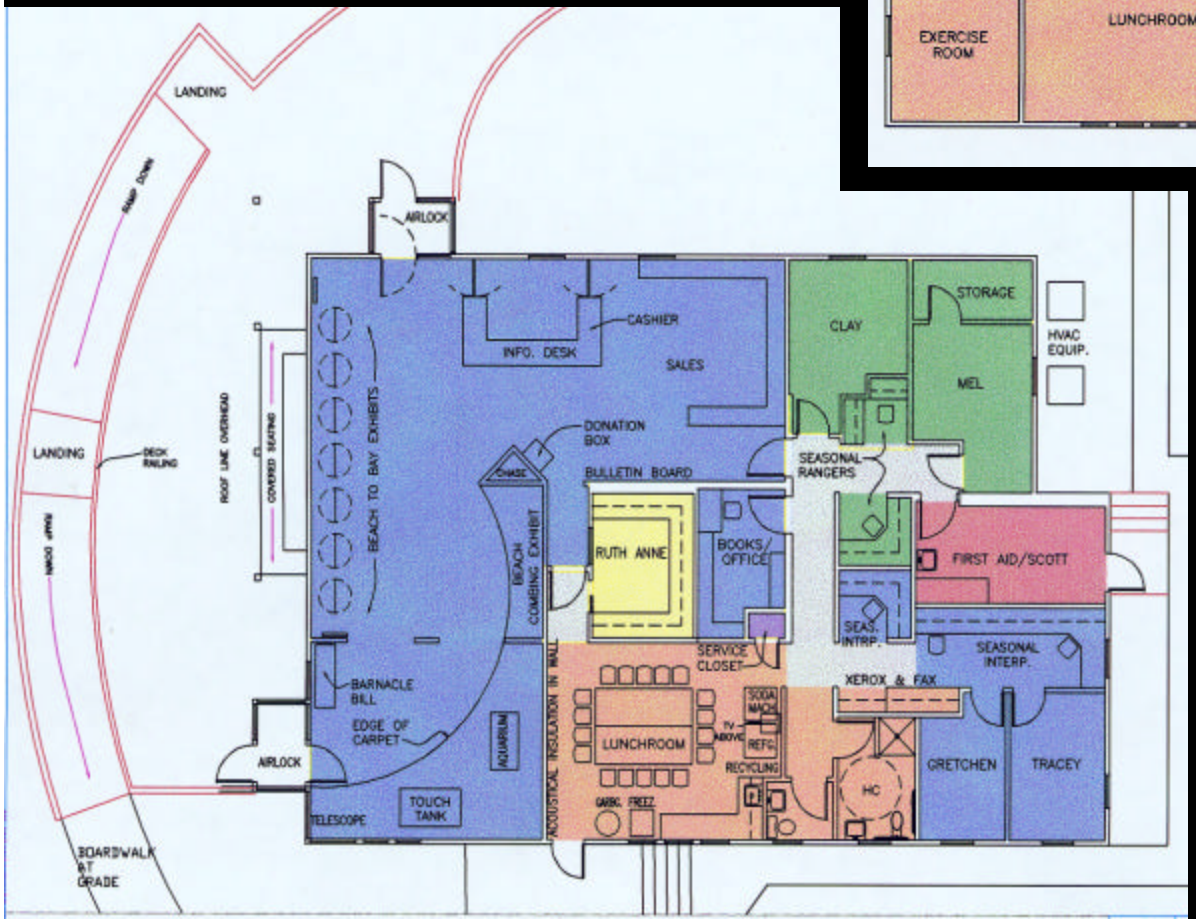
Site Analysis

Goal 2: Reconfigure the floor plan to increase (double) the area for the Visitor Center function.



After

Before



LEGEND

- INTERPRETATION
- MAINTENANCE
- LAW ENFORCEMENT
- LIFEGUARD OPERATION
- ADMINISTRATION
- CIRCULATION
- SHARED SPACE


Goal 3: Take advantage of views across Toms Cove

Goal 4: **Continue to transform the Toms Cove District into a model for sustainable practices in a harsh, dynamic, barrier island location and interpret these efforts to our visitors.**

Fully operable, insulated **windows** and fiberglass insulation was installed throughout the exterior building envelope.


Entrance vestibules reduce air exchanges and cooling loads during the high-visitation summer season.

Solar Tubes allow daylight to enter without the heat gains and losses associated with conventional skylights.


Compact fluorescent lamps
INTERDUNE
SHRUB THICKET
FOREST
SALT MARSH
Spring-Summer
BAY
Exhibits are reused from original Visitor Center

Occupancy sensors prevent unnecessary illumination of frequently unoccupied spaces

Radiant Heat Barrier

Two layers of aluminum separated by a thin layer of flexible plastic that acts as a thermal barrier to heat conductance.

VERY CHEAP & EFFECTIVE!

Www.u-b-kool.com

www.azinfo.com/horizon/rbswrap.htm


Walls framed with reclaimed studs and sheathed with drywall that has recycled content

Exhibits from original Toms Cove Visitor Center


Excess office furniture from DOD surplus


Old, half-round
“log cabin” siding
New fiber-
cement siding


18” x18”
Recycled
Carpet Tile


VOC-free
interior paint
Reclaimed lumber


Biocomposite
surfacing


Crushed eggshells

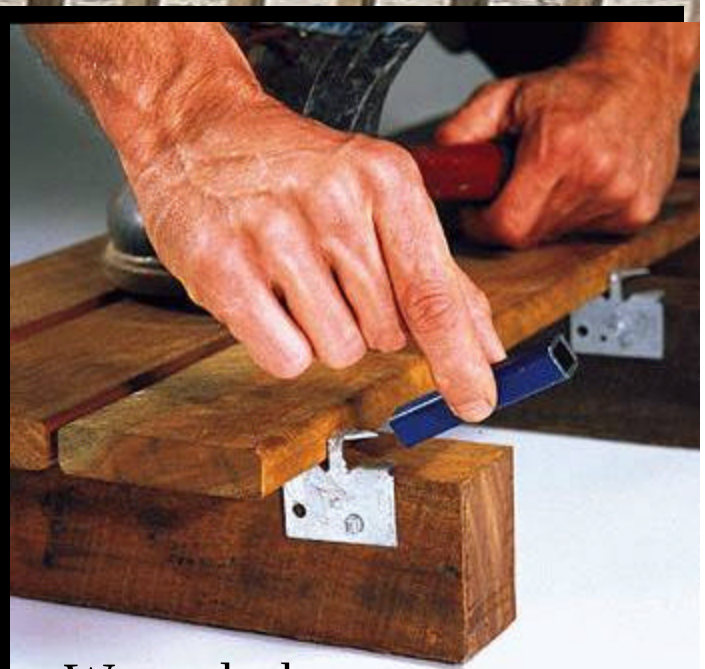
Dakota Burl composite is a unique bio-based material created from an abundant agricultural fiber, sunflower seed hulls, bound together with soybean-based resin, sealed with citrus oil, but...

www.phenixbiocomposites.com


Green = CCA-treated lumber
(Chromated Copper Arsenate contains arsenic)
Brown = ACQ treated lumber
(Alkaline Copper Quat is arsenic-free)
www.treatedwood.com/architect/preserve.html

Don’t face-nail
TREX lumber!

www.trex.com



Www.deckone.com


The interpretive boardwalk will be similar to this one


Visitor Center
9AM-4PM
Reclaimed lumber
Crushed clam shells


Views
across
Toms
Cove

Environmental Building News - monthly newsletter


Environmental Building News

The Leading Newsletter on Environmentally Responsible Design & Construction

Volume 9, Number 2 — www.ebuild.com — February 2000

Building Commissioning: The Key to Buildings That Work

IN THE NOT-SO-DISTANT PAST, BUILDings were simpler than they are now, and the roles of building professionals were less specialized and fragmented. Architects could effectively oversee the construction process, and contractors understood all the systems they were installing. Buildings were expected to provide basic shelter. If they had comfort-control systems, a relatively wide margin of indoor conditions was generally tolerated.

Today all that has changed, especially in larger commercial and institutional buildings. The buildings contain many sophisticated systems for controlling comfort conditions and lighting, moving people and equipment, providing security from intruders, and enhancing occupant safety. Building envelope and structural systems are also more complex, with engineered membranes and coatings, selective-surface glazings, and other features.

Designing and installing these systems requires specialists who may have only a limited understanding about how each system affects other aspects of the building. Furthermore, these specialists are often discouraged by tight budgets and liability concerns from asking questions about components that are not within their strict areas of responsibility. Amazing as it may sound, it is not unusual for large and very expensive buildings to be built without any one party having overall responsibility for ensuring that the systems all work properly. Enter building commissioning.

What Is Commissioning?

According to the Building Commissioning Association: "The basic purpose of building commissioning is to provide documented confirmation that building systems function in compliance with criteria set forth in the Project Documents to satisfy the owner's operational needs." In simpler terms, commissioning involves a party—other than the designer or contractor—who is charged with ensuring that a completed building meets the design intent and requirements of the owner. The practice originated, as the term suggests, as a more comprehensive version of standard mechanical

continued on page 10

In This Issue:

Quote of the month:

"I have yet to see a significant building failure that building commissioning wouldn't have prevented."

J. David Odom, Building Services Group, OPDM HNC

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"Green" Product Directory

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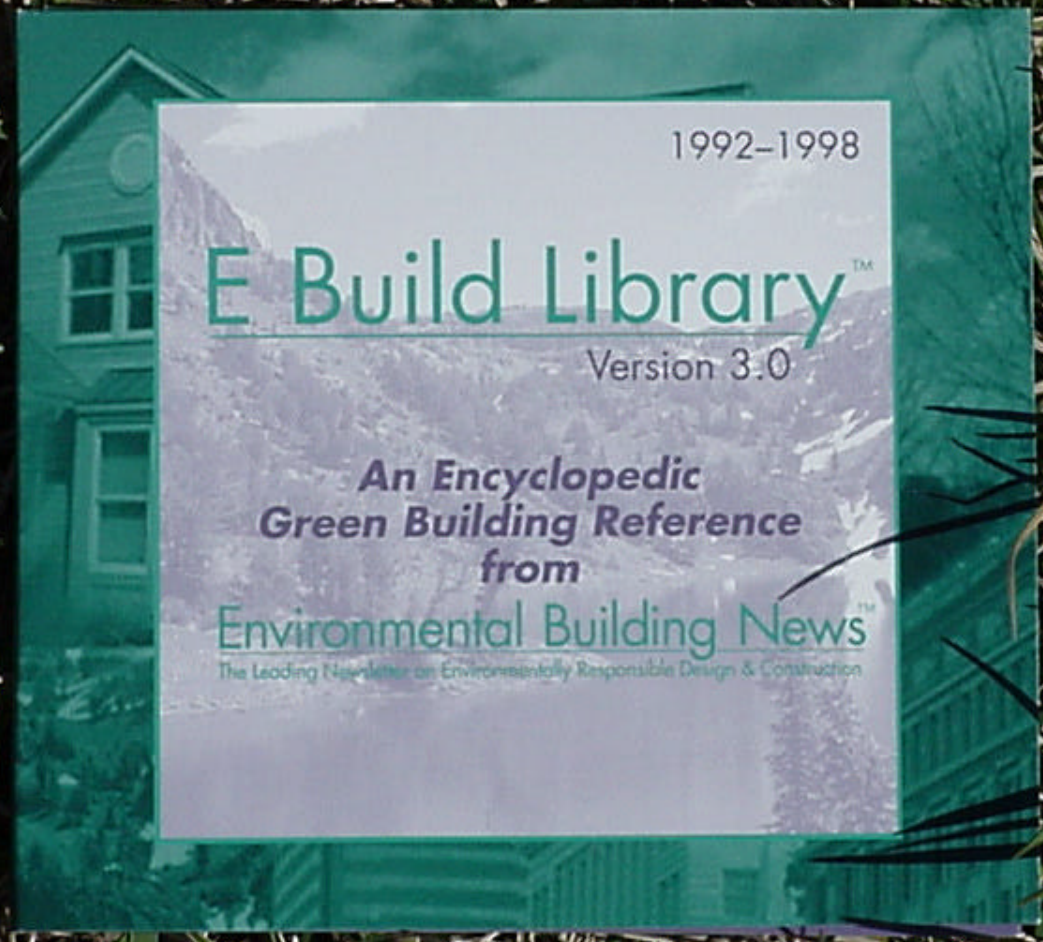
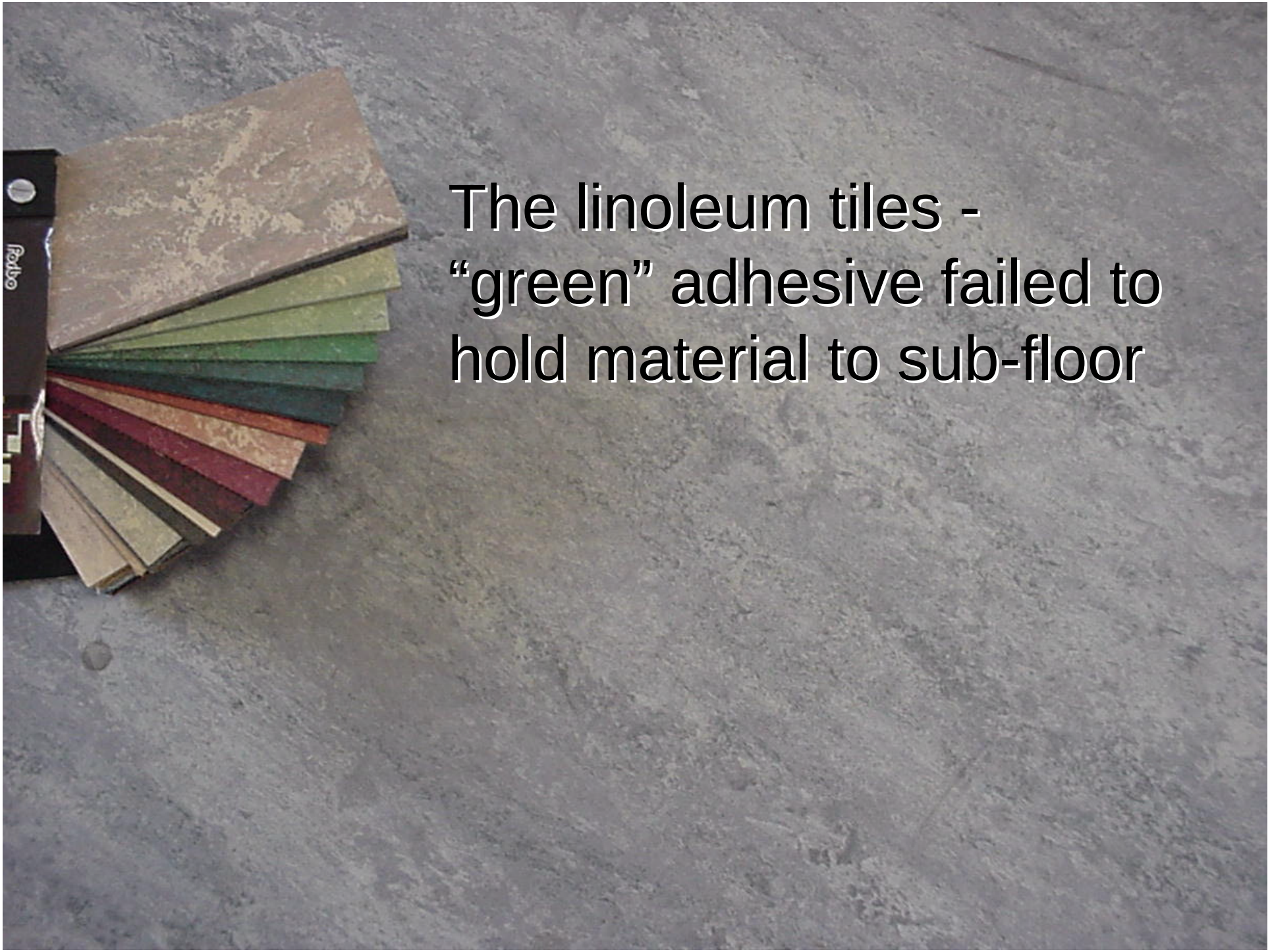
E Build Library



6 years of EBN back issues on CD_ROM in a VERY USER-FRIENDLY FORMAT

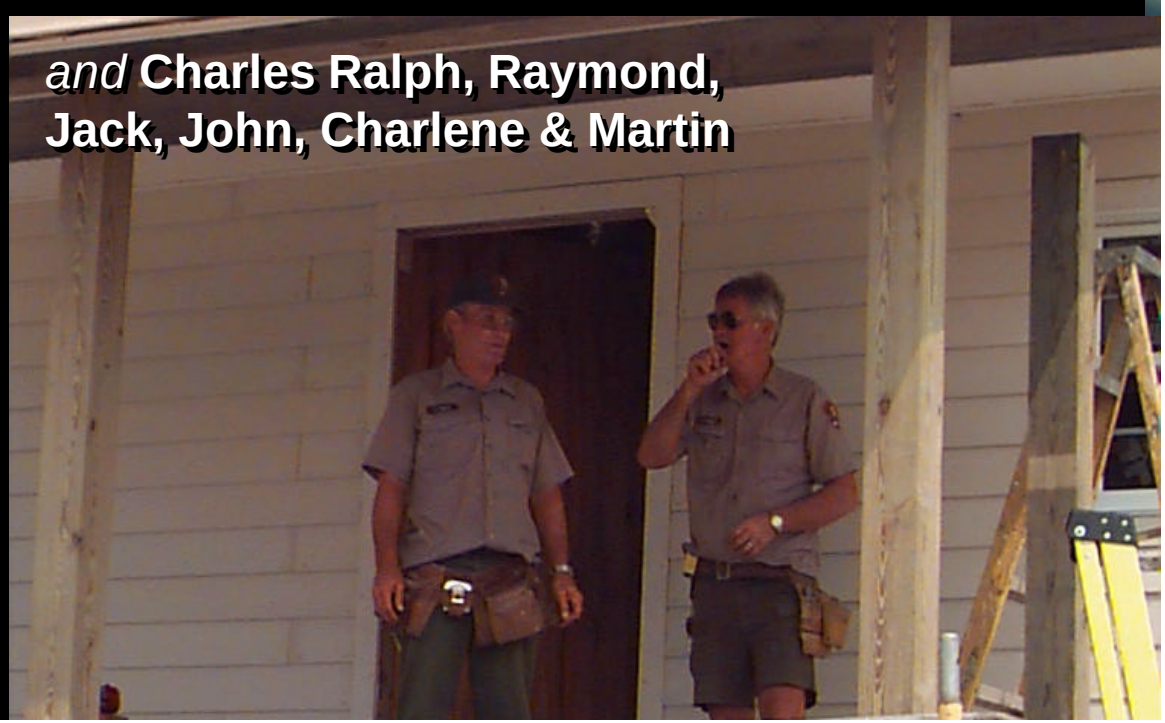

The linoleum tiles -
“green” adhesive failed to
hold material to sub-floor

Who made all of this possible?

Roy “Boss” Ross
Facility Manager

Ish “Crab” Ennis
Maintenance Foreman

Eddie Watson



and **Charles Ralph, Raymond, Jack, John, Charlene & Martin**

Contractors/Consultants/Resources

- The Denver Service Center - Jim “Dr. Dirt” Ellis
- Harry M. White - Building Movers
- ASIS Contracting Officer
- Arbor Vitae Design - Furniture Fabricators
- Various contractors, suppliers and vendors

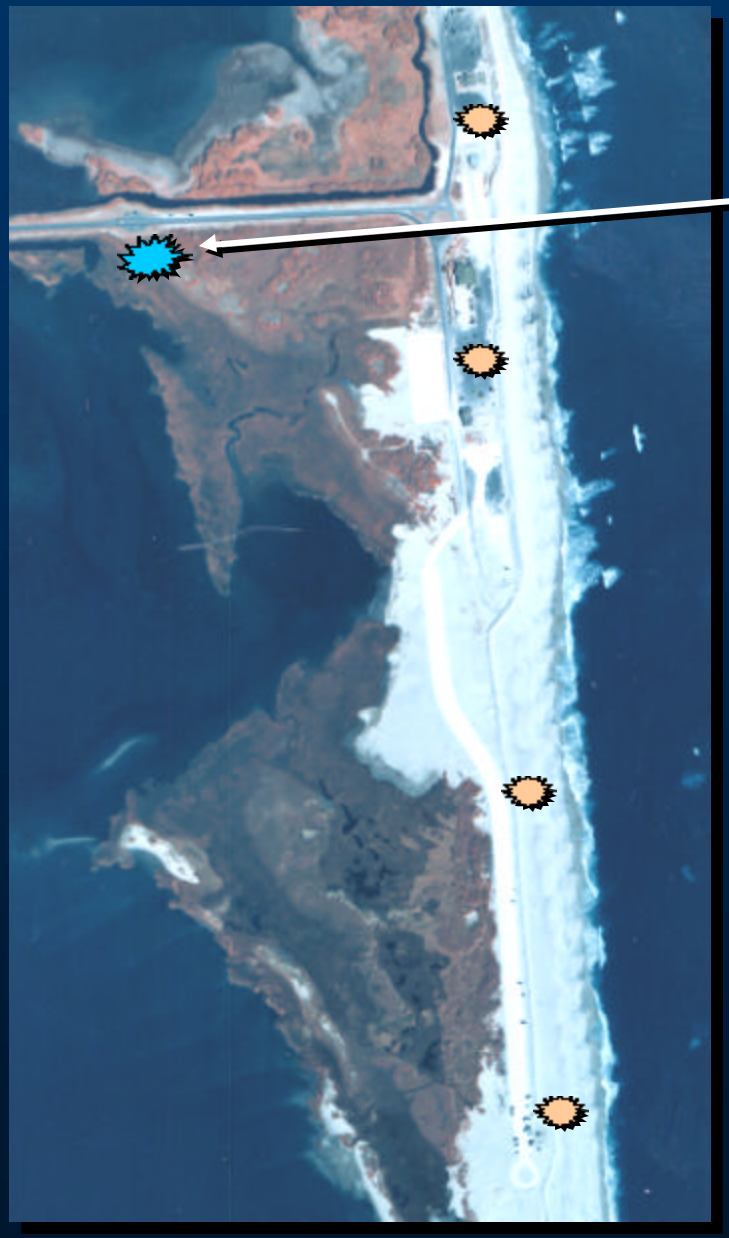
Current Projects

Assateague Beach Coast Guard Station

Sustainable Bathhouse Project

Toms Cove Visitor Center Relocation

Bathhouse Site Plan



Relocated Visitor Center

Approximate Bathhouse Locations

Current Site Work

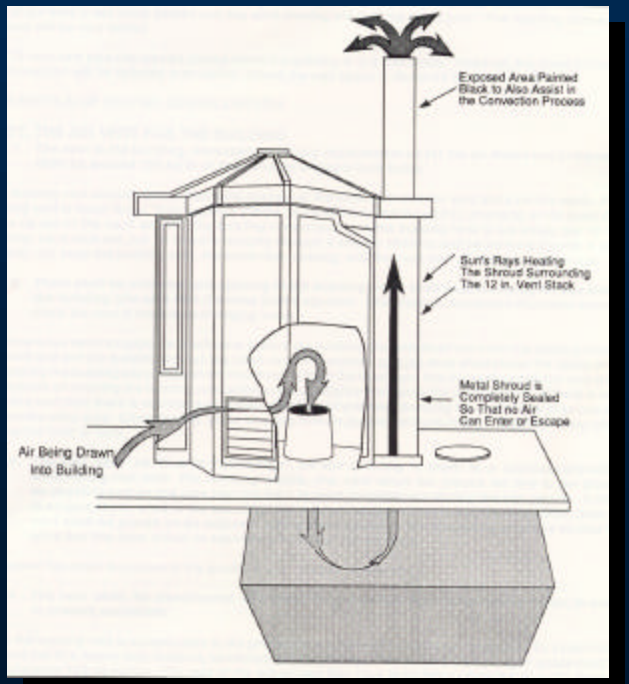
Asphalt roads and parking lots have been removed and replaced with crushed clam shells.

Bathhouse #2 will eventually be deconstructed

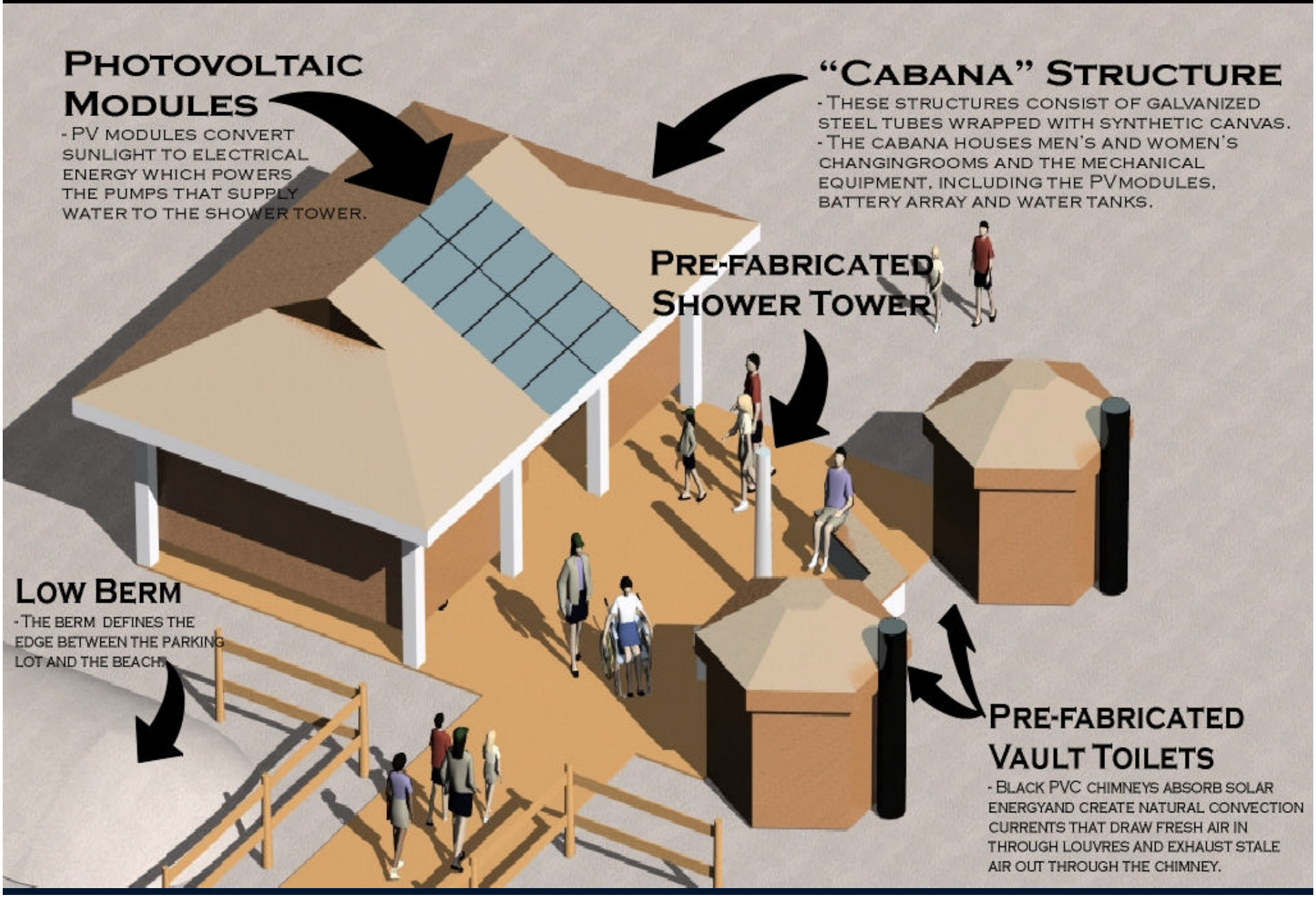
Shower Tower and Romtec Toilets

Pre-manufactured vault toilets and shower fixtures were field tested last summer

How does the passive ventilation work?



Cabana - First Concept



Cabana - First Concept

Step One

- The prefabricated vault toilets, shower tower and exterior decking have been removed from the site and placed in temporary storage.

Step Three

- The canvas is easily removed from the galvanized steel frames. The structure is unbolted, disassembled, loaded onto a flatbed trailer and taken to temporary storage.

Step Two

- The cabana structure breaks down into three sections.

Step Four

- The center section of the cabana remains intact. This includes the PV modules, the mech. equip. & the changing stall benches. The hinged roof clamps down & all of the remaining pieces are taken to storage.

Prototypical Cabana and Shower Tower

These structures are being tested on the beach this summer.

Conceptual rendering

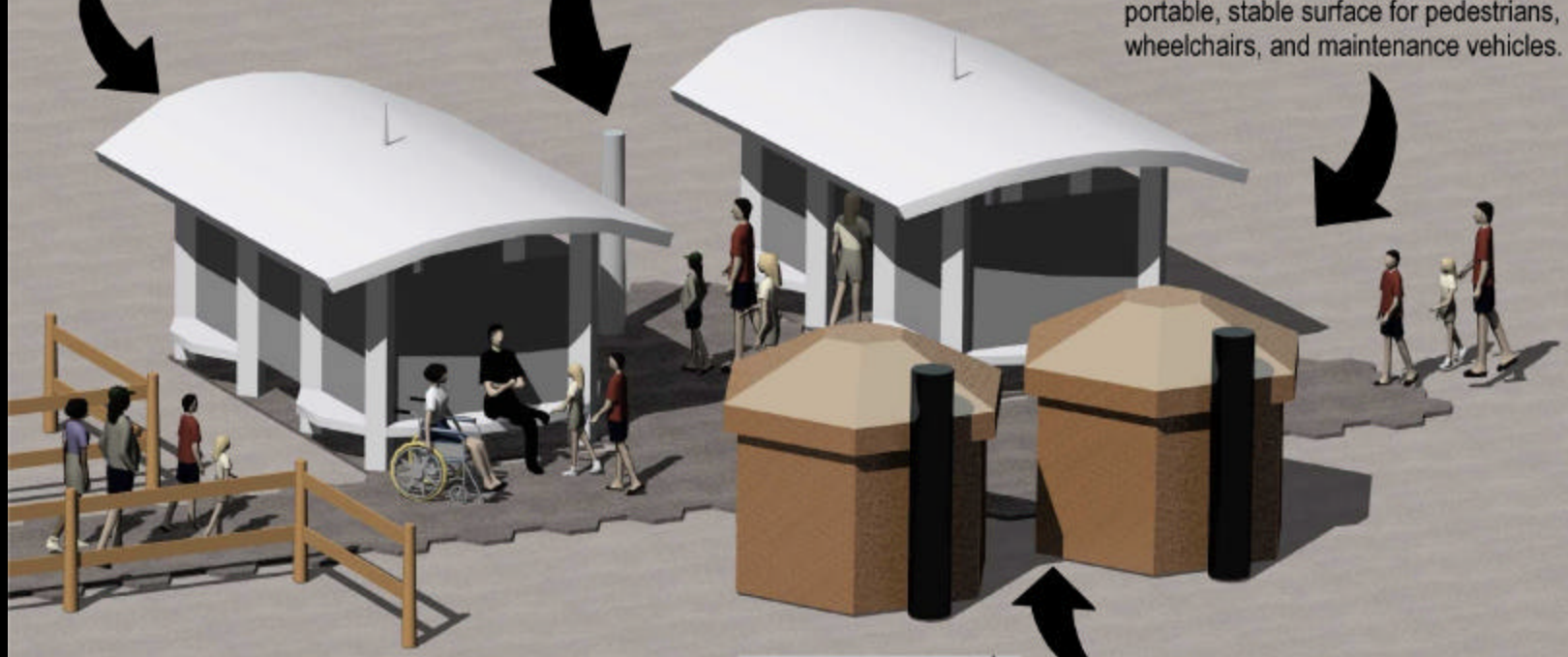
Photograph of test installation

Assateague Island National Seashore
Sustainable Bathhouse Project

"Cabana" Structures
These lightweight structures, fabricated with annodized aluminum or galvanized steel tubes wrapped with synthetic canvas, provide changing rooms that are quick, safe, and easy to set up and dismantle.

Outdoor Shower Tower
This unit provides a brief, cold-water rinse shower. The fixture is equipped with quick-disconnect fittings to allow repeated, rapid installation and removal.

Pedestrian Surfacing
These lightweight, interlocking panels made from recycled plastic provide a portable, stable surface for pedestrians, wheelchairs, and maintenance vehicles.



Solar Powered equipment in enclosed utility trailer
The photovoltaic (PV) modules convert sunlight to electrical energy, which powers the pumps that supply water to the shower tower. The PV modules and the mechanical equipment, including the battery array, water tanks, and controllers are installed in an easily transportable utility trailer.

Pre-fabricated Vault Toilets
The black PVC chimney absorbs solar energy and creates natural convection currents that draw fresh air in through vents and exhaust stale air out through the chimney. These structures will be modified to facilitate rapid removal from the beach during pre-storm evacuations.

Assateague Island National Seashore
Sustainable Bathhouse Project

"Cabana" Structures

These lightweight structures are fabricated with stainless steel tubes wrapped with recycled synthetic canvas. They provide changing rooms that are quick, safe, and easy to set up and dismantle.

Outdoor Shower Tower

This unit provides a brief, cold-water rinse shower. The fixture is equipped with quick-disconnect fittings to allow repeated, rapid installation and removal.

Picnic Table Awnings

These shade structures will be retrofitted to existing tables.

Pre-fabricated Vault Toilets

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Solar Powered equipment

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Pedestrian Surfacing

Reclaimed lumber panels provide a portable, stable surface for pedestrians, wheelchairs, and maintenance vehicles.

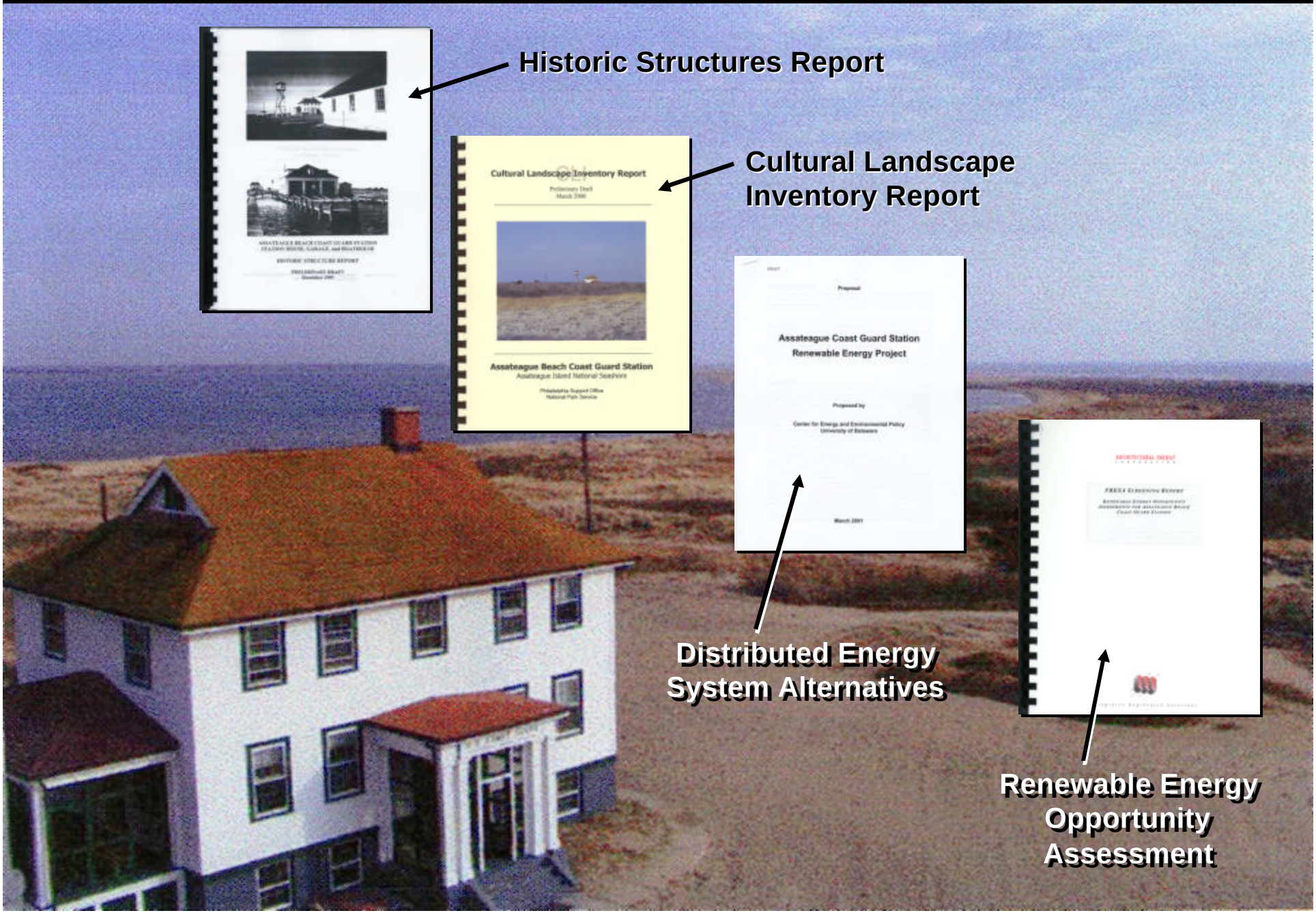
Shade Structure

Existing table retrofitted with removable canvas awning

Renewable Energy Retrofit to Coast Guard Station

Environmental Education and Ecotourism

Renewable Energy Retrofit to Coast Guard Station



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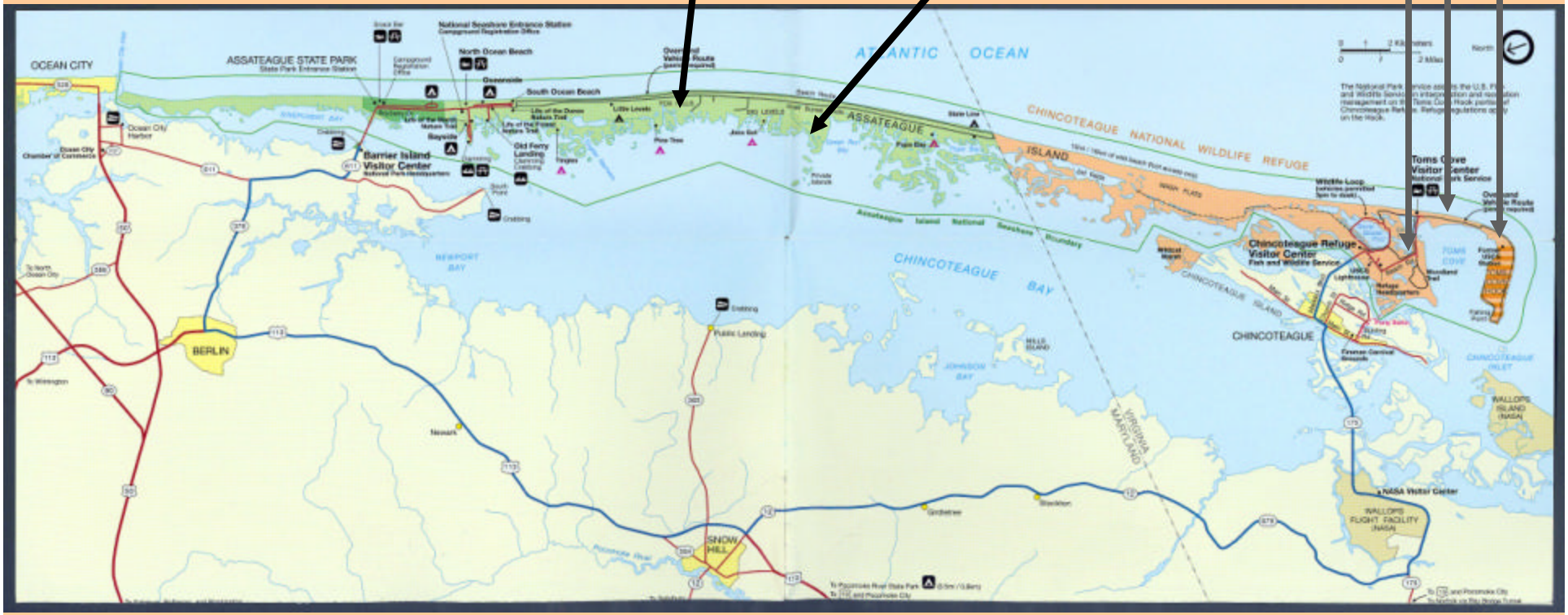


Landscape Restoration, Recycling and Renewable Energy

Assateague Island National Seashore

Telephone Pole Removal - Bike Trail Guardrail Project

Landscape Restoration, Waste Prevention and Recycling

Within the Sinepuxent District of the National Seashore there were twelve miles of telephone poles and overhead cables that were no longer in use and need to be removed for aesthetic and safety concerns. This project includes both the removal of the telephone poles and cables from their current position on the island and their reuse to construct a heavy timber guardrail barrier between the bike trail and the entrance road. This effort will help to restore the barrier island landscape to a more natural appearance and prevent the creosote treated telephone poles and copper cables from ending up in a landfill.

Timber Guardrail - Section

Timber Guardrail - Elevation

Installation of the Guardrail Begins

Visitor Safety

Currently, a two-mile stretch of the bike trail runs adjacent to the Park entrance road in the Sinepuxent District of the National Seashore. A narrow, gravel median is all that separates the two-lane, 35M PH road from the eight-foot wide bike trail. Motor vehicles often stray off of the road, across the median and onto the trail as visitors view the wildlife, endangering the animals, bicyclists and pedestrians. In addition to construction of the guardrail, this project includes stabilization of the gravel median with an application of a safe, non-toxic, polymer emulsion product that does not change the pH of the soil, wash away, or re-emulsify with rain. In addition, this product will not leach into the ground water or contribute any pollutants or BOD (Biological Oxygen Demand) to storm water runoff. Construction of the guardrail and stabilization of the gravel median will correct this extremely hazardous situation, which has been a high-priority safety concern for the park.

Results

Completion of this project will meet resource management, visitor safety, landscape restoration and sustainability goals, and is a highly effective recovery and reuse of "waste" materials.

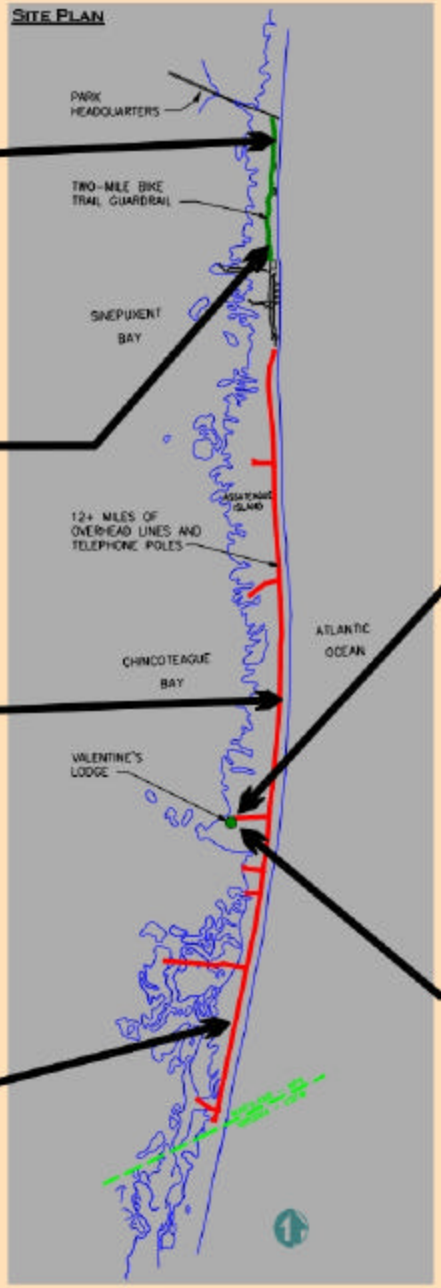
Old Image of Baltimore Blvd with Telephone Poles

Recent Image of Baltimore Blvd without Telephone Poles

Old Image of Baltimore Blvd with Telephone Poles

Recent Image of Baltimore Blvd without Telephone Poles

Site Plan



Valentine's Lodge Project

Valentine's Lodge

Renewable Energy in Backcountry Lodge

There are several structures within the Maryland end of Assateague Island that were previously used as hunting lodges. One of them, Valentine's Lodge, is currently in relatively sound condition and will be rehabilitated so that it can be used for environmental education opportunities, ecotourism and resource management staging areas.

This project consists of retrofitting the Valentine's Lodge structure with two separate but synergistically meshed systems to be incorporated into a building that will not be connected to the electric grid or a natural gas pipeline.

View of Chincoteague Bay from Valentine's Dock

NREL/NPS Test Bed

The NPS in concert with the National Renewable Energy Laboratory, will use the Valentine Lodge project as a test bed for determining the optimal mix of PV and solar thermal technologies for use in NPS buildings. Subsequent monitoring of this installation also help determine the degree to which "Zero Conventional Energy" systems, using renewable technologies, can be attained in NPS facilities and the potential for replication of the Valentine Lodge project in other isolated, off-the-grid, intermittently occupied NPS buildings.

Finally, the renewable energy retrofit to Valentine's Lodge will make an NPS contribution to reducing fossil energy use in Federal facilities, as mandated in the National Energy Policy Act and Presidential Executive Orders.

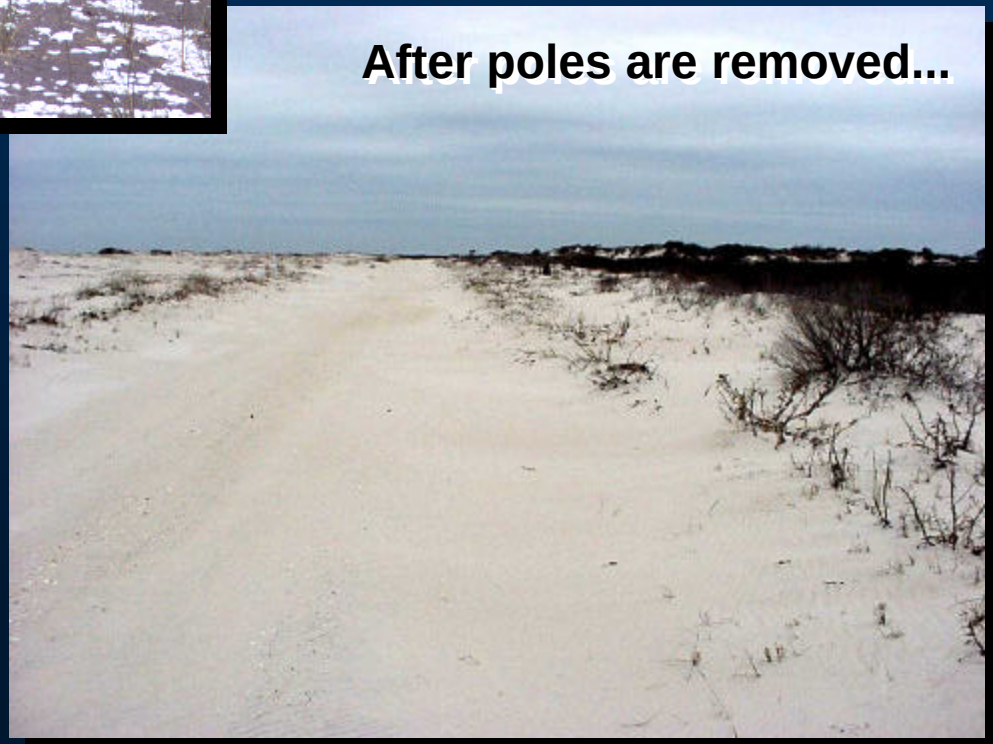
View of Chincoteague Bay from Valentine's Lodge

Project Measure/Results

By utilizing solar and wind power to generate electricity and passive solar strategies to heat and cool the structure, this project will reduce the carbon dioxide and greenhouse gas emissions associated with electrical power generation and the burning of fossil fuels. The simultaneous removal of overhead power lines to this site will result in a more naturally appearing coastal landscape and will eliminate the costs of maintaining these tenuous utility connections to this remote location in a harsh coastal environment. Perhaps most importantly, this project will help Assateague Island National Seashore to demonstrate the NPS commitment to sustainable design, energy conservation and resource protection to it's 2 million annual visitors.

Before pole removal...

After poles are removed...



Telephone Pole Removal / Bike Trail Barrier

Valentine's Lodge - Renewable Energy Retrofit

- Environmental Education, Ecotourism and Research base camp
- Employ a combination of PV, Wind, Solar Hot Water

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Entrance Station Relocation

Headquarters Complex

Existing NPS Entrance Station

Headquarters Site Plan

Relocate Entrance Station

- Sustainable Design & Renewable Energy

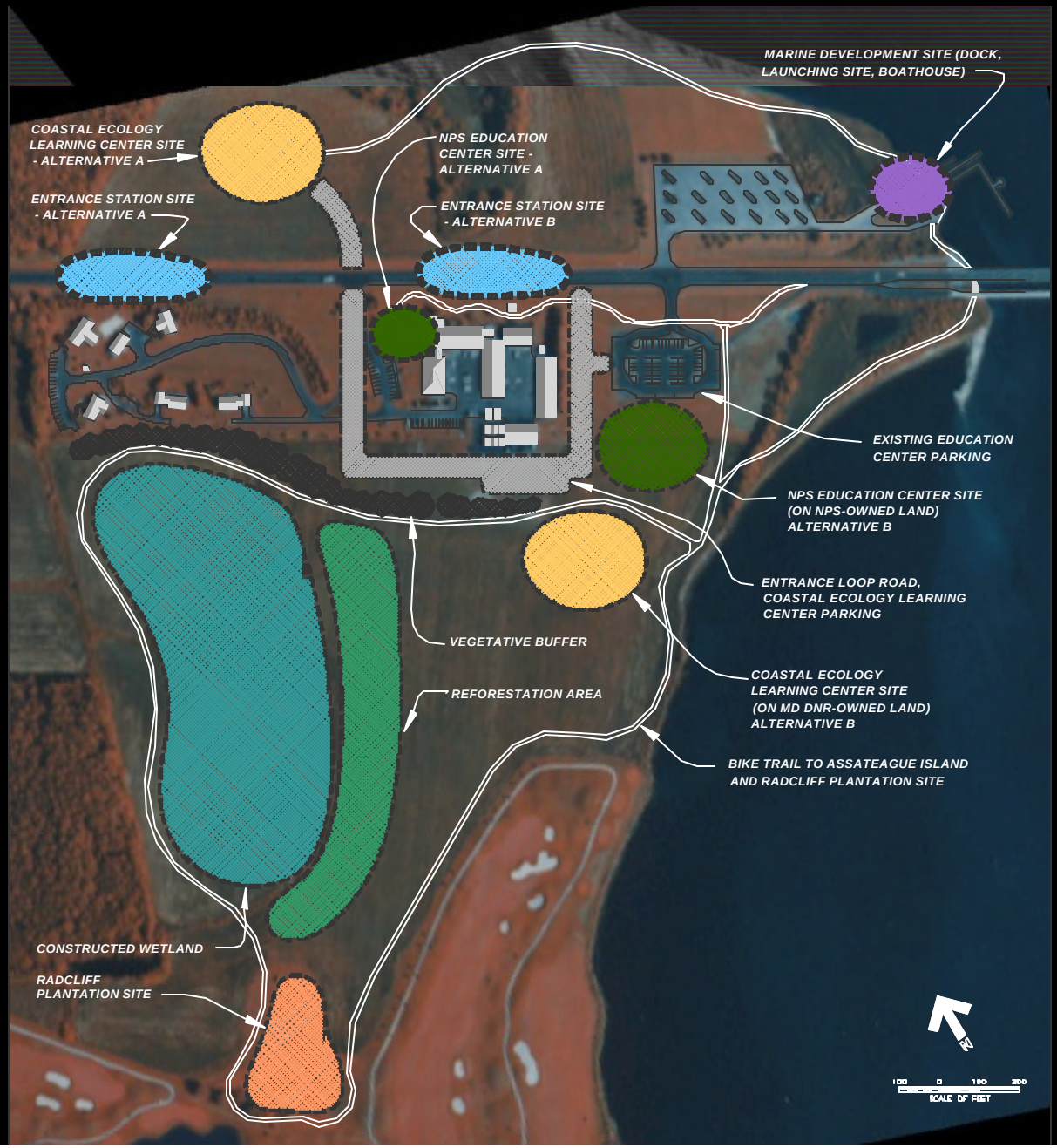
Coastal Ecology Learning Center

- Sustainable Design & Renewable Energy

Energy Saver Audit (DOE)

- ESPC?
- PV? Wind? Microturbine?

Headquarters Site Plan



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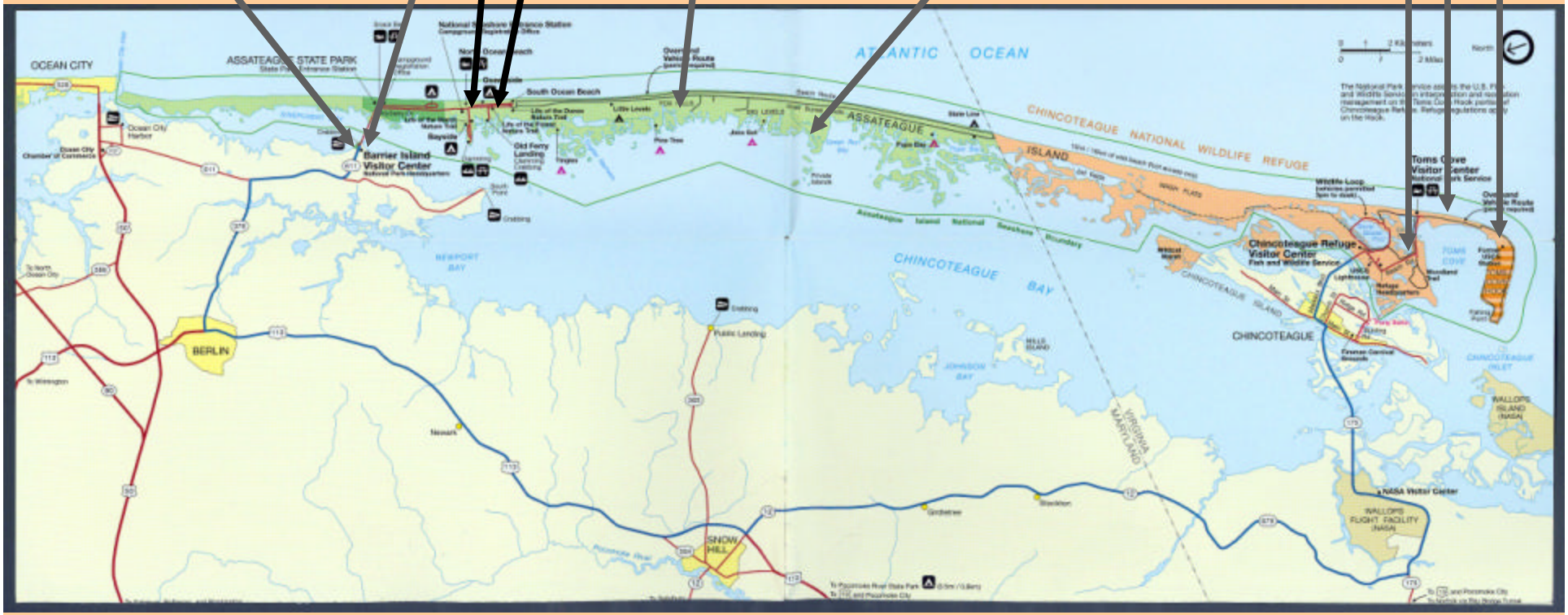


Assateague Island National Seashore Campground Map

Atlantic Ocean

LEGEND

- Water
- Public Parking
- Picnic Area
- Public Phone
- ORV Access
- Waste Station
- Showers
- Self-Guided Trail
- Restrooms
- Swimming Beach

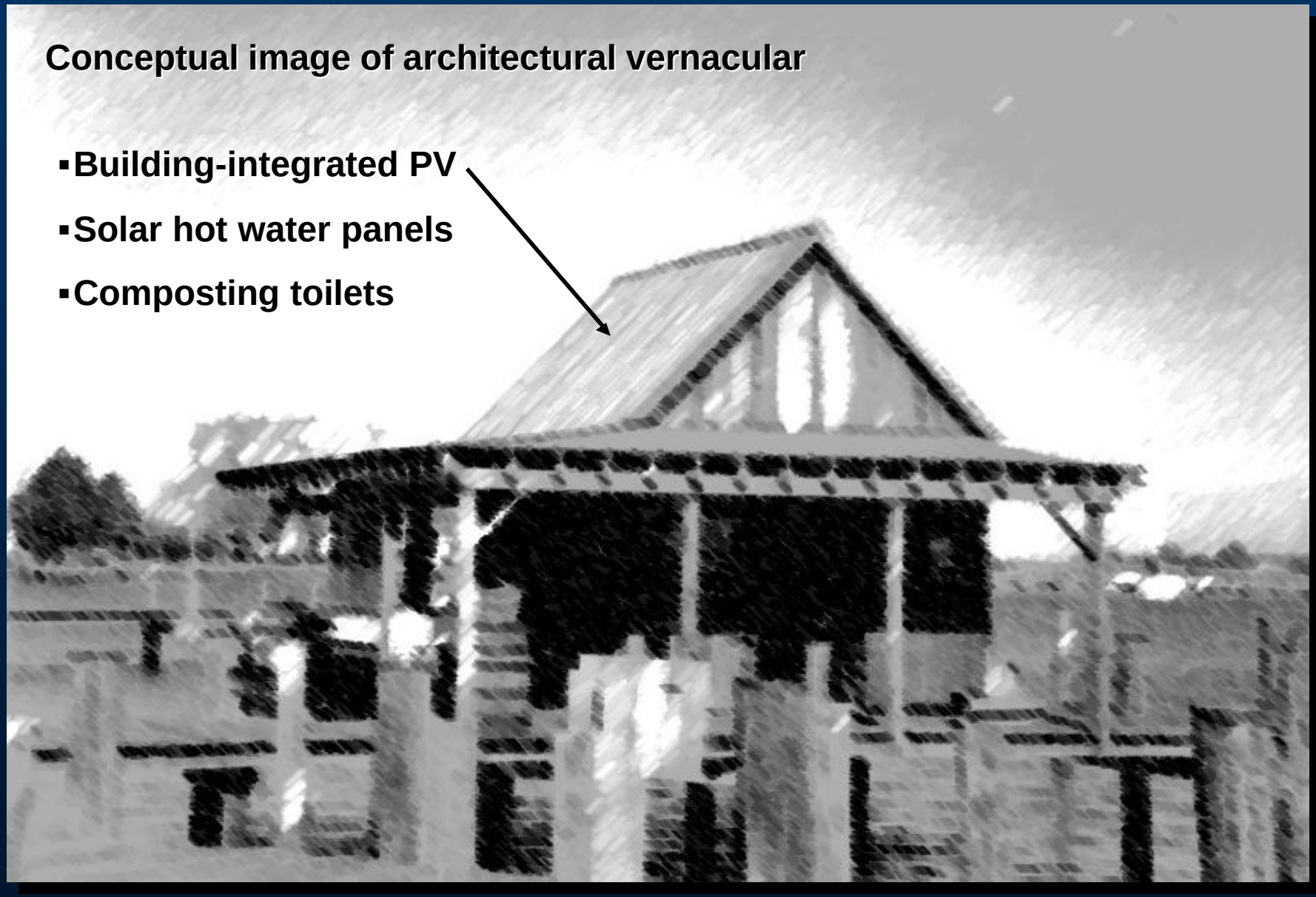
0 500 1000 Feet

Map by NPS ASIS GIS March 1998

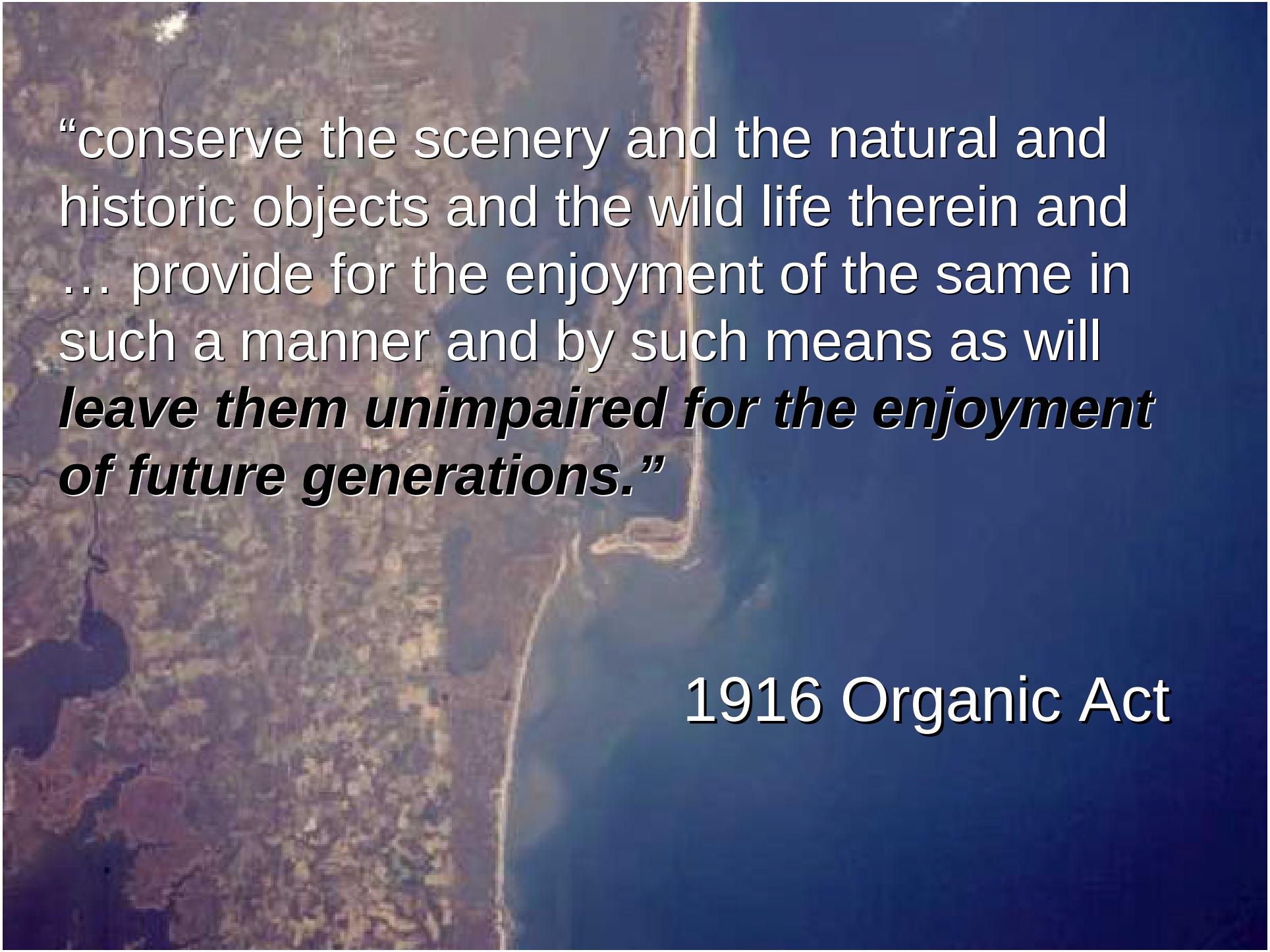
Existing Campground Bathhouses

Existing Day-Use Bathhouse

Bathhouse Replacement Project



Lifeguard Stand


“conserve the scenery and the natural and historic objects and the wild life therein and … provide for the enjoyment of the same in such a manner and by such means as will ***leave them unimpaired for the enjoyment of future generations.”***
1916 Organic Act


Have you hugged your GIS people today?
Thank you, Assateague GIS


Thanks
Chris Finlay- Architect
Assateague Island National Seashore